
Chapter 10 — DPNSS1/DASS2 Maintenance

Overview

This chapter provides maintenance information for DPNSS1/DASS2.

D-channel service states

The D-channel handler interface (DCHI) has five software service states:

- 1 Disabled Not Responding** - in this state the DCHI is disabled and does not respond to a read/write test. All channels are disabled.
- 2 Disabled Responding** - in this state the DCHI only responds to an enable message.
- 3 Enable Idle** - in this state the DCHI responds to messages sent to it but all channels are disabled. This is a transitory state during the enable sequence.
- 4 Enabled Starting** - in this state the DCHI responds to messages sent to it. The DCHI is in the process of being started and some channels are in the 'Enabled Idle' state while others are in the 'Disabled' state.
- 5 Enabled Active** - in this state the DCHI responds to all messages sent to it and all channels which are configured should be 'Enabled Idle' or in one of the busy states.

B-channel service states

Each of the channels can be in one of eleven states:

- 1 **Unequipped** - the channel is not configured in software
- 2 **Disabled** - the channel is in the disabled state
- 3 **Enabled Idle** - the channel is available for use
- 4 **Enabled Software Busy** - the channel is being used for speech transmission.
- 5 **Enabled Maintenance Busy** - the channel is maintenance busied
- 6 **Enabled Permanently Busy** - the channel is more permanently busied for outgoing calls
- 7 **Disabled but resetting**
- 8 **Enabled Idle but Resetting**
- 9 **Enabled Software Busy but Resetting**
- 10 **Enabled Maintenance Busy but Resetting**
- 11 **Enabled Permanently Busy but Resetting**

Manual maintenance

Overlay 75 commands

Maintenance requirements are handled by overlay 75, which can be loaded from a teletype or from a maintenance set. Overlay 75 allows you to do the following:

- Disable and enable individual channels when the DCHI is ENBL ACTIVE.

Obtain the status of a DCHI, DDCS or channel.

Clear the maintenance display and/or minor alarm.

Command	Description
ENL DDSL n	Enables DCHI n
ENL DDCS 1	Enables the PRI loop 1
ENL DTRC 1 c	Enables real channel 1 c
ENL DTVC 1 c	Enables virtual channel 1 c
DIS DDSL n	Disables DCHI n
DIS DDCS 1	Disables the DDCS loop 1
DISI DDCS 1	Disables all channels on loop 1 as they become idle
DIS DTRC 1 c	Disables real channel 1 c
DIS DTVC 1 c	Disables virtual channel 1 c
STAT DDSL	Gives status of all DCHIs
STAT DDSL n	Gives status of DCHI n
STAT DDCS	Gives status of all DDCS loops
STAT DDCS 1	Gives the status of DDCS loop 1, as well as a count of the number of channels in each state
STAT DTRC 1 c	Gives status of real channel 1 c
STAT DTVC 1 c	Gives status of virtual channel 1 c
STRT n	Starts DCHI n
CDSP	Clears the maintenance display
CMIN U	Clears the minor alarm for customer U

Bringing an IDA link into service

In overlay 75:

- 1 Enable the DDCS loop.
- 2 Enable the DCHI link. This puts it into the ENBL IDLE state.
- 3 Start the DCHI link. This makes it go from ENBL STARTING to ENBL ACTIVE.

Both ends of the link should be started within 5 minutes of each other.

Taking a link out of service

In overlay 75:

- 1 Disable all the channels
- 2 Disable the DCHI link. This makes it go from ENBL IDLE to DSBL.
- 3 Disable the DDCCS loop

Step 1 can be omitted, but calls will be force disconnected by Step 2. If an enabled card is removed, the system initializes.

DPNSS1/DASS2 alarms

The software currently monitors the following alarms associated with the DPNSS1/DASS2 link.

- TBF - Transmit Buffer Full
- FAE - Frame Alignment Error
- HER - High Error Rate
- TSF - Transmit Signaling Failure
- AIS - Alarm Indication Signal
- LOI - Loss of Input
- DAI - Distant Alarm Indication

There are two criteria:

- An alarm is present for more than the 'persistence time' defined for that alarm.
- An alarm occurs more times than the 'reset count threshold' within the period defined by the 'monitor time' for that alarm.

In either case, the link is stopped, and a minor alarm is raised. When all alarms are cleared, the link is restarted. Various diagnostic messages are issued for alarms.

Test Messages

Test messages are sent to all DCHIs every 30 seconds in order to check the level 3/level 2 interface. The test patterns are echoed back unchanged. If the number of failed tests since midnight exceeds the "Test Message Threshold" (TMT) defined, then the link is reset and a minor alarm is raised.

TMT may be set to infinity if 255 is entered, in which case the link is not reset due to tests failing.

A check is also carried out every 30 seconds on the DCHI states perceived by the hardware and software. If there is a difference, then the link is reset and a minor alarm is raised.

Various diagnostic messages are issued for these faults.

Initialize

When the system is initialized, all PRIs and DCHIs are tested and reset. If the initialize follows a system reload or is the result of pressing the manual initialize button, then all links are brought into service. If the initialize occurs for any other reason, the links which are not disabled are reset.

Link Reset

When certain faults are detected, the DCHI is reset. This amounts to taking the link of service (so that the DCHI is disabled) and then bringing it back into service. This sequence may fail, in which case the link could be left disabled or idled.

Channel Reset

The software may reset a channel:

- when there is difficulty clearing a call;
- each time a channel is enabled;
- when the channel buffer on the card overflows.

The channel is disabled (any call in progress is force disconnected), and the associated lap is reset; the channel is re-enabled when the reset is completed.

The DDCS may itself initiate a channel reset, i.e. when there is difficulty communicating with the far end.

Various diagnostic messages are issued for a channel reset.

If the number of channel resets since midnight exceeds the "Channel Reset Threshold" (CRT) defined, then the link is reset and a minor alarm is raised.

CRT may be set to infinity if 255 is entered, in which case the link is not reset due to channel reset failure.

Stop Count

A count is kept of the number of times since midnight that a link is stopped due to an alarm or for a link reset. If the count exceeds the "Stop Count Threshold" (SCT) then the link is disabled. It remains disabled until it is brought back into service manually.

A diagnostic message is issued for this.

SCT may be set to infinity if 255 is entered, in which case the link is not disabled due to excessive stopping.

Channel Configuration

DPNSS1 and DASS2 are message based signaling systems which use a common signaling channel in timeslot 16. Each traffic channel has an associated LAP; the LAPs operate in parallel over the signaling channel. Each traffic channel (together with its LAP) represents one trunk.

A DCHI is informed of the configuration of its LAPs each time it is enabled. If a discrepancy between the hardware and software configurations is detected during call processing, the software attempts to correct the DCHI's configuration.

Level 2 - Level 3 Communication

If Level 3 (i.e. software) cannot send a message to level 2 (i.e. the DCHI) because no output buffer is available, a diagnostic message is issued. If level 2 cannot send a message to level 3 because no input buffer is available, there is no immediate message. Both cases are included in traffic printouts.

Input messages received by level 3 are checked for validity (i.e. the length must be consistent with the message type). A diagnostic message is issued for any discrepancy.